The Color X-ray Camera (CXC) of type SLcam® is a device for energy- and space-resolved X-ray fluorescence (XRF) measurements. It consists of a high-speed CCD detector coupled to a polycapillary optic that conducts the X-ray photons from the probe to distinct pixels onto the detector.

The camera is capable of fast acquisition of spatially and energy resolved fluorescence images. A dedicated software enables the acquisition and the online processing of the spectral data for all 69696 pixels, leading to a real-time visualization of the elements distribution in a sample.

The CXC allows real 3D XRF measurements on larger objects for the first time. Therefore the sample is excited with a razor-sharp beam and moved stepwise to get the element distribution per layer with one measurement. These layers can be combined to a full 3D image afterwards. As the information is achieved layer per layer, there is no need for reconstruction techniques, which are quite often the cause of artifacts in the results achieved by computer tomography.

The field of applications is wide, as the elemental distribution inside of a material give clues to processes inside of samples from a variety of origins. The technique is of special interest for biological samples, because a light matrix minimizes restricting absorption effects, and archaeometry, due to the non-destructive nature.

Examples of 2D mappings, 3D measurements on insects and the benefits of special geometries like TXRF or WDX will be presented.

Fig1.; Examples: (a) Picture of a hornet, (b) The visualization of its measured surface by the scattered signal (c) The distribution of Ca and Fe in the tooth of a red toothed shrew with 8 μm resolution.

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